

Spinal Cord Injuries and Society

Scoring Sheet

STUDENT #1

For Full credit:

- 10 10 points Work submitted on time. When class time was given to work on project student used the time effectively.
- 10 15 points Project follows guidelines stated in Rubric
-2 FONT CHOICE -5 writing lacks transitions
-1 not completely typed
- 20 20 points Description of technology either in use or in development that is designed to help those with spinal cord injuries. Did you answer this question, how does this treatment work to repair damage or assist in mobility? You correctly stated that stem cells can become nerve cells!
- 20 20 points The student described in detail some of the challenges that using this technology presents. You mentioned surgery, death, AND the fact that the human body is complex
- 10 20 points The student fully identified any Bioethical controversy surrounding the use of the chosen technology and its applications. Student elaborated and included examples of those who are for and against the use of the treatment. You included who is for AND AGAINST But NOT why they feel that way they DO!
- 15 15 points Class presentation and participation in discussion. You relayed the topic you investigated to the class and any new treatment that you thought might be effective to treat spinal cord injuries and why. You answered the closing questions in full. You were attentive and respectful of differing opinions presented in class.

Total possible points: 100

Your Score

82

Student name:

I was impressed that you offered the nerve insight about stem cells that can come from NASAL neurons. Why did you not include this in the paper?

Name:

Class:

Block 2

Date:

3-15-04

ID: A

142

Spinal Cord and PNS

True/False

(1 point each)

Indicate whether the sentence or statement is true or false.

82/100
85/100

Excellent!

42

- T 1. The elongated extension of a neuron that receives impulses from the cell body is called an axon.
- T 2. The basic unit of the nervous system is the nerve cell, or neuron.
- T 3. The peripheral nervous system carries all the messages back and forth between the central nervous system and the rest of the body.
- T 4. A spinal reflex is an involuntary response that requires the spinal cord but not the brain.
- F 5. In some neurons, a form of supporting cell called a myelin sheath wraps around the axon.
- F 6. Myelin sheaths slow down nerve impulses by forcing them to jump from node to node.
- F 7. The inside of a resting neuron has a positive charge.
- T 8. Neurons communicate with other cells by sending neurotransmitters across synapses.
- T 9. Neurotransmitters are chemical messengers that carry nerve impulses across the synapse.

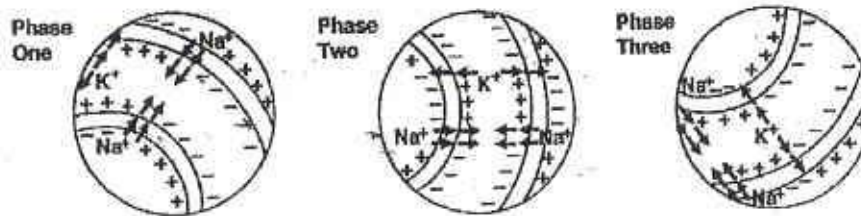
Multiple Choice

(2 points each use deductive reasoning process)

Identify the letter of the choice that best completes the statement or answers the question.

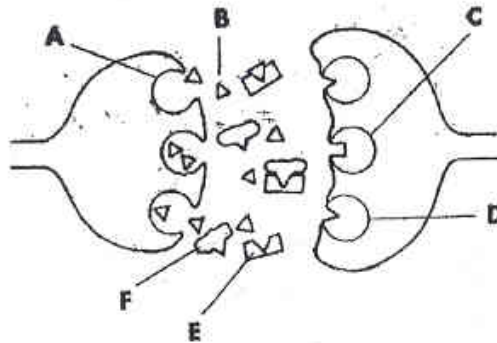
- A 10. The central nervous system consists of
 a. the brain and spinal cord.
 b. spinal nerves only.
 c. the brain stem and cerebellum.
 d. the cerebrum and spinal cord.
- A 11. The gray matter of the brain consists of
 a. cell bodies of neurons.
 b. only synapses.
 c. myelin.
 d. nodes.
- A 12. Which part of the spinal cord contains the cell bodies of neurons?
 a. gray matter
 b. dorsal root
 c. ventral root
 d. white matter
- C 13. Which part of the spinal cord contains motor neurons?
 a. gray matter
 b. dorsal root
 c. ventral root
 d. All of the above
- D 14. Information is carried from the central nervous system to a muscle or gland by
 a. sensory neurons.
 b. afferent neurons.
 c. reticular neurons.
 d. motor neurons.
- C 15. Sensory neurons transmit messages
 a. from the central nervous system to a muscle or gland.
 b. from the brain to the spinal cord.
 c. from the environment to the spinal cord or brain.
 d. within the brain.

I am
 glad you
 reasoned your
 way through
 this section
 using the
 M/C technique



- C 25. Refer to the illustration above. When a neuron is at rest,
- sodium ions are found mostly on the outside of the cell.
 - potassium ions are found mostly on the inside of the cell.
 - ☒ the inside of the cell is negatively charged.
 - ~~All of the above~~
- A 26. Refer to the illustration above. The diagrams indicate that a nerve impulse
- ☒ moves from the inside to the outside of an axon.
 - moves from the outside to the inside of an axon.
 - is the movement of an action potential along a neuron.
 - ~~moves slowly.~~
- B 27. Refer to the illustration above. When an impulse moves down the axon,
- ~~sodium ions first rush out of the cell.~~
 - ☒ a small part of the axon momentarily reverses its polarity.
 - ~~the resting potential of the cell does not change.~~
 - potassium ions are pumped into the axon.
- A 28. Refer to the illustration above. An action potential may be described as
- ☒ an electrical impulse.
 - an electromagnetic message.
 - a chemical message.
 - ~~a chemical change occurring in the brain.~~
- C 29. Electrical changes in a neuron create
- ~~a stimulus.~~
 - an electrical shock.
 - ☒ an action potential.
 - light and sound.

STUDENT #1
44



- A 30. Refer to the illustration above. In the diagram, label "B" indicates a
- ☒ a. neurotransmitter molecule.
 - ☐ b. neuromodulator molecule.
 - ☐ c. receptor protein molecule.
 - ☒ d. psychoactive drug molecule.
- C 31. Refer to the illustration above. If neurotransmitters could not be cleared out of a synapse after transmitting a message,
- ☐ a. a second neuron would continue to be stimulated for an indefinite period of time.
 - ☒ b. the first neuron could not pass on its impulse.
 - ☐ c. neuromodulators would be formed in the synapse.
 - ☒ d. the neurotransmitter would mimic the effect of a psychoactive drug.
- C 32. Neurotransmitters are
- ☒ a. electrical impulses.
 - ☐ b. found only in neurons with myelin sheaths.
 - ☐ c. released at synapses.
 - ☒ d. produced by muscles.

Completion

Complete each sentence or statement.

33. Nerves that control breathing, swallowing, heartbeat, and the diameter of the blood vessels are found in the brain stem.
34. The brain and spinal cord are surrounded by three protective layers collectively called the meninges.
35. All of the nervous system outside the spinal cord and brain is known as the peripheral nervous system.
36. The division of the autonomic nervous system that controls stimulation of internal organs during routine conditions is called the parasympathetic nervous system.
37. A sudden, involuntary movement in response to a stimulus is called a(n) reflex.
38. A(n) neuron is the basic unit of communication of the nervous system.
39. The junction of a neuron with another neuron or muscle cell is called a(n) synapse.

Name: _____

ID: A

STUDENT #1

Essay

3 SENTENCES MINIMUM!! (3 points)

40. Briefly describe how sensory receptors help you maintain posture and keep your balance. Write your answer in the space below.

Sensory receptors maintain posture by receiving info from the stimulus then sends them over to ^{the} neuron. Then the motor neuron goes to the muscle or gland. Then the sensory neuron met up with a motor neuron at a synapse and formed an interneuron. This all works together to help keep your balance and posture.

How is the Brain involved -1

Name: _____ Class: _____ Date: _____

ID: A

STUDENT #1

Spinal Cord and PNS

Multiple Choice

(2 points EACH USE DEDUCTIVE REASONING)
Identify the letter of the choice that best completes the statement or answers the question.

- A 41. Neurons are classified by the
a. direction in which they carry impulses.
b. amount of metabolic activity that takes place.
c. ~~number of dendrites that branch out.~~
d. ~~number of impulses that they carry.~~
- C 42. What is the function of neurotransmitters?
a. to transmit nerve impulses through dendrites
b. to stimulate the production of epinephrine
c. to transmit nerve impulses across synapses
d. ~~none of the above~~
- C 43. For a neuron to reach an action potential, it must
a. ~~release electrons.~~
b. ~~absorb calcium.~~
c. reverse the electrical charge across the cell membrane.
d. take in sodium ions.
- B 44. The division of the nervous system that helps the body react to pain is the
a. ~~somatic nervous system.~~
b. ~~sensory nervous system.~~
c. autonomic nervous system.
d. ~~sympathetic nervous system.~~

Modified True/False

(1 point EACH)

Indicate whether the sentence or statement is true or false. If false, change the identified word or phrase to make the sentence or statement true.

- F 45. The propagation of an action potential is slower in myelinated axons than in axons that lack a myelin sheath.
faster
- F 46. The brain and spinal cord can withstand considerable trauma due to the meninges acting as a shock absorber.
cerebral spinal fluid
- T 47. If you accidentally step on a tack with your bare foot, the pathway that the nerve impulse takes from your foot to your leg is called a reflex arc.
- T 48. The autonomic nervous system is part of the motor division of the peripheral nervous system.

Name: _____

STUDENT #1

Completion

Complete each sentence or statement.

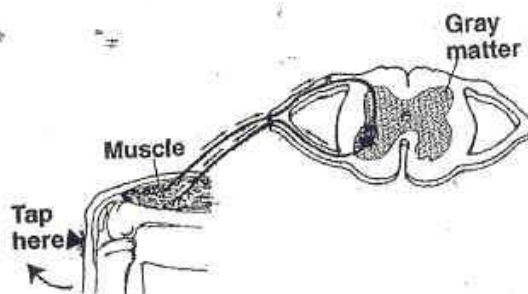


Figure 35-3

- 4 a The process illustrated in Figure 35-3 is called a(an) knee jerk reflex
b The turning of your head is controlled by the somatic nervous system, which is part of the peripheral nervous system's motor division.

- Short Answer 2 SENTENCES MAXIMUM!! (2 points EACH) carries
250 Distinguish between the functions of dendrites and axons. dendrites - send impulses through cell body
51. At what location does a neuron transfer an impulse to another cell? axon - sends impulses out from cell body
52. How is the spinal cord like a major telephone line? synapse
53. What is a motor neuron? it sends messages out in all directions
sends impulses out to muscles or glands

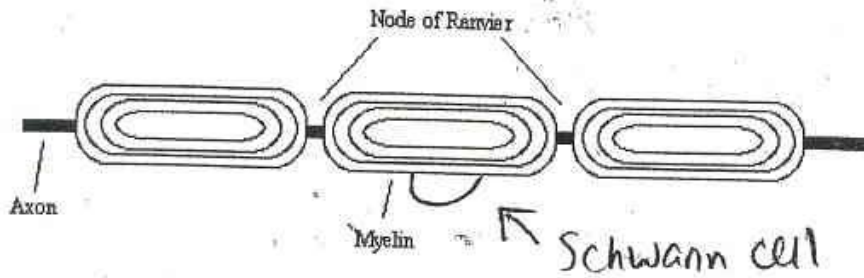
- Essay 3 SENTENCES MINIMUM!! (3 points EACH)
54. Compare resting potential and action potential in a neuron. The charge across what part of the neuron?
55. Compare the effects of the sympathetic and the parasympathetic divisions of the autonomic nervous system.
56. When there is a resting potential the charge is negative.
57. When there is an action potential the polarity is reversed and becomes positive. So they are different when the charge of the neuron changes.
58. The sympathetic division controls "fight-or-flight." The parasympathetic division controls the stimulation of internal organs during routine conditions. The sympathetic division works to tense up neurons and the parasympathetic calms the neurons down after.

56.

STUDENT #1

1 point EACH

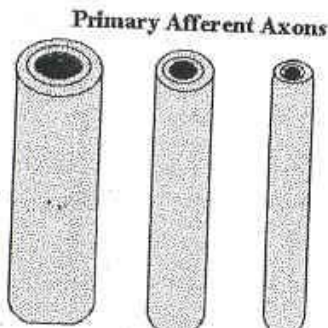
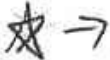
4/8



56. WHERE WOULD A SCHWANN CELL BE LOCATED ON THIS DIAGRAM ABOVE?

57.

58.



Axon Type Diameter (μm)

Aα 13-20

Aβ 6-12

Aδ 1-5

C 2-1.5

57. PUT A STAR (★) (AND AN ARROW POINTING) TO THE LEFT OF THE AXON WHICH WOULD HAVE THE FASTEST CONDUCTION VELOCITY?

58. PUT AN ASTERISK (*) TO THE RIGHT OF THE AXON WHICH WOULD HAVE THE SLOWEST CONDUCTION VELOCITY?

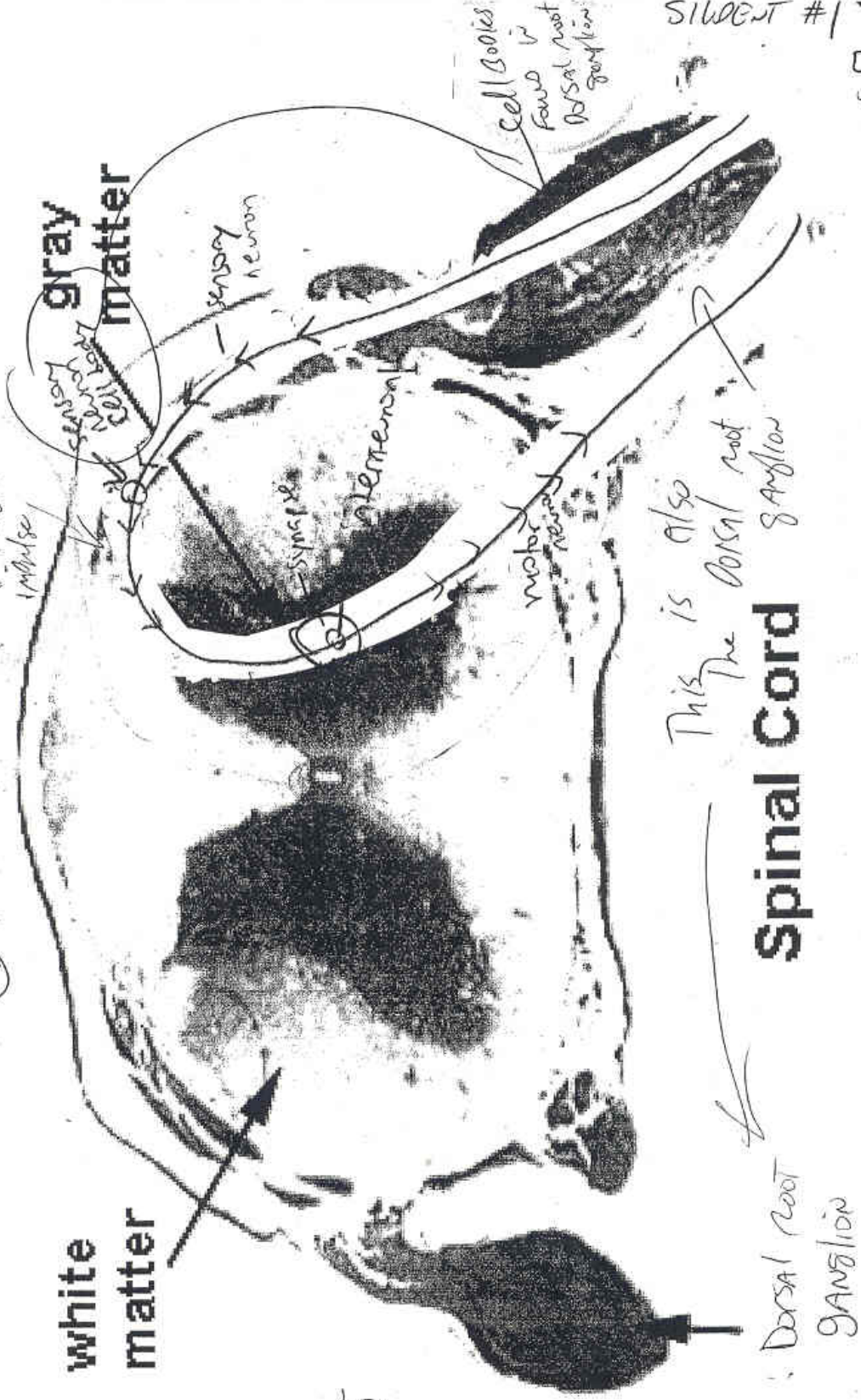
59. LOOK AT THE MRI IMAGE OF A PATIENT CERVICAL SPINE. DRAW AN ARROW TO AND LABEL THE SPINAL CORD. ALSO CIRCLE THE DISC WHICH APPEARS TO BE PRESSING ON THE SPINAL CORD.

DRAW AND LABEL
60. (1 point per structure)

- ① SENSORY NEURON
- ② SENSORY NEURON CELL BODY
- ③ INTERNEURON
- ④ MOTOR NEURON

SHOW SYNAPSES
BETWEEN SENSORY, INTERNEURON
AND MOTOR NEURON

good work
probably be
improved



STUDENT #1

50